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NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

DAVE MARTIN
Cabinet Secretary

BUTCH TONGATE
Deputy Secretary

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

June 13, 2012

P. Maggiore, Assistant Manager
Los Alamos Site Office
3747 West Jemez Road, MS A316
Los Alamos, NM 87544

Michael J. Graham, Associate Director
Environmental Programs
Los Alamos National Security, L.L.C.
P.O. Box 1663, MS M991
Los Alamos, NM 87545

RE: DISAPPROVAL
INVESTIGATION REPORT FOR LOWER MORTANDAD / CEDRO CANYONS AGGREGATE AREA
LOS ALAMOS NATIONAL LABORATORY
EPA ID #NM0890010515
HWB-LANL-11-082

Dear Messrs. Maggiore and Graham:

The New Mexico Environment Department (NMED) has received the United States Department of Energy (DOE) and the Los Alamos National Security L.L.C.'s (LANS) (collectively, the Permittees) *Investigation Report for Lower Mortandad/Cedro Canyons Aggregate Area* (IR), dated October 2011, received October 11, 2011, and referenced by LA-UR-11-5335 and EP2011-0304. NMED has completed review of the IR and hereby issues this Disapproval.

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General Comments:

1. The construction worker receptor was not evaluated at Lower Mortendad/Cedro Canyons Aggregate Area. Current and foreseeable future land use is industrial and as such, the construction worker receptor must be included in risk assessments where intrusive activities, such as digging and excavation may occur. For many constituents, evaluation of a residential receptor would be protective of a construction worker receptor; however, this is not the case for some inorganic constituents such as barium, beryllium, and manganese. However, as barium, beryllium, and manganese were not listed as constituents of potential concern (COPCs) at the sites evaluated in this investigation, the construction worker must be evaluated at least qualitatively. Modify the risk assessments at Solid Waste Management Units (SWMUs) 05-003, 05-004, 05-005(b), and 05-006(c) to include evaluation of a construction worker receptor.

2. The January 2010 Lower Mortandad/Cedro Canyons Aggregate Area Investigation Work Plan (IWP) indicates that sediment samples would "...be collected from areas of sediment accumulation that include sediment determined to be representative of the historical period of Laboratory operations. The locations will be selected by the field geologist based on geomorphic relationships in areas likely to have been affected by discharges from laboratory operations."

   The January 22, 2011 NMED approval with modifications of the IWP required the Permittees to include a geomorphic characterization report as an appendix in the IR. The purpose of the characterization report was to provide information on how representative sediment sampling locations were actually selected.

   Section B-9.0 (*Deviations from the Work Plan*) of the IR indicates "Preparation of a geomorphic characterization report is beyond the scope of investigation activities previously and currently conducted for aggregate area investigations. Therefore, the geomorphic characterization report was not prepared and is not presented as an appendix to this investigation report."

   Sediment samples were collected at SWMU 05-004 (seven samples) and SWMU 05-005(b) (four samples). However, IR Appendix B (*Field Methods*) provides no information concerning how the field geologist determined that a chosen sediment sample location was "...determined to be representative of the historical period of Laboratory operations." and was "...based on geomorphic relationships in areas likely to have been affected by discharges from laboratory operations."

   In the response to this comment, provide a discussion that explains how the sediment sampling locations were chosen in the field, including how the determination was made that a given sample location was representative of geomorphic conditions most likely to have been affected by laboratory operations.

3. The vapor intrusion pathway was not evaluated in the risk assessments at Lower Mortendad/Cedro Canyons Aggregate Area. As shown on Figure I-3.1-1 (Conceptual Site Model), volatilization and subsequent inhalation of contaminants is shown to be a potentially complete pathway. Volatile organic compounds (VOCs) were detected at three of the four sites evaluated in the investigation report and evaluation of this pathway must be included in the risk assessments conducted at Lower Mortendad/Cedro Canyons Aggregate Area. Update the risk assessments to include evaluation of the vapor intrusion pathway.

4. Recent research provides evidence that hexavalent chromium is carcinogenic by a mutagenic mode of action via ingestion. The New Jersey Department of Environmental Protection (NJDEP) released a publication entitled *Derivation of Ingestion-Based Soil Remediation Criterion for Cr^{+6} Based on the NTP Chronic Bioassay Data for Sodium Dichromate Dihydrate* (April 8, 2009) which presents cancer potency values derived from a two-year dose-response study conducted by the National Toxicology Program (2008). NJDEP derived an oral cancer potency value of 0.5 milligrams per kilogram per day (mg/kg-day) for hexavalent chromium. Based on this information, the risk-based human health screening levels would be lower than the screening levels presented and utilized in the human health risk assessments in this investigation report. The 2012 NMED Soil Screening Levels (SSLs) as well as the US EPA's (2011) Regional Screening Levels also include screening levels for hexavalent chromium in soil and tap water utilizing the NJDEP updated oral cancer slope factor of 0.5 mg/kg-day and age-adjustment calculations for exposure to mutagenic constituents. Modify the human health risk assessments to utilize the updated soil and tap water screening levels for hexavalent chromium and the oral cancer slope factor of 0.5 mg/kg-day.

Specific Comments:

5. **Figure I-3.1-1 Conceptual Site Model for Lower Mortandad/Cedro Canyons Aggregate Area, page I-31:**

   NMED Comment: The exposure pathways presented on the conceptual site model are designated as 'very low', 'low', 'moderate', or 'not applicable'. Based on these designations, it is not clear from the figure which pathways were determined to be complete and whether they were evaluated in the risk assessments. Modify Figure I-3.1-1 to indicate whether the pathways are designated as complete or incomplete, and if they are evaluated (quantitatively and/or qualitatively) in the risk assessments.

6. **Section I-5.4.4 Comparison with Background Concentrations, page I-19:**

   NMED Comment: Several inorganics were eliminated as constituents of potential ecological concern (COPECs) based on a comparison of exposure point concentrations (EPCs) with background concentrations, as shown on Tables I-5.4-1, I-5.4-2, and I-5.4-3.

This is not an appropriate screening tool to be used to eliminate COPECs from further evaluation in the ecological risk assessments for the following reasons:

a. Site-to-background comparisons were already conducted in the nature and extent of contamination investigations and resulted in the lists of COPCs to be retained for analysis in the risk assessments;

b. It is not appropriate to compare 95% upper confidence limits (UCLs) with individual background concentration terms. In cases where statistical tests concluded that site concentrations of COPCs were elevated compared to background, EPCs based on 95% UCLs would be greater than 95% UCLs that could be calculated for the background data set. Therefore, it is incorrect to assume that exposure to EPCs (based on 95% UCLs) for inorganic COPCs would be the same as exposure to background levels.

c. Chromium was eliminated as a COPEC at SWMU 05-006(c) despite having an EPC greater than the range of background concentrations. Thus, the EPC versus background comparison appears to be incomplete;

d. Refinement of inorganic COPECs should include application of area use factors and use of soil screening levels based on lowest observed adverse effects levels (LOAELs).

Remove the discussion comparing EPCs with background concentrations from the ecological risk assessments at SWMUs 05-004, 05-005(b), and 05-006(c). Retain all inorganics that were eliminated as COPECs based on a comparison of EPCs with background concentrations. Modify the ecological risk assessments to utilize the accepted methods for refining COPECs, such as the application of area use factors and use of ecological screening levels based on LOAELs.

7. **Table I-5.4-4, PAUFs and AUFs for Ecological Receptors at SWMUs 05-004, 05-005(b), and 05-006(c), page I-67:**

NMED Comment: The population area use factors (PAUFs) shown on Table I-5.4-4 appear to be incorrect. The footnote explains that the PAUF is calculated as the area of the site divided by the population area. For example, the PAUF at SWMU 05-004 for the American Kestrel should be calculated as 0.003 hectares (ha)/4240 ha = 7E-7. However, a value of 6E-8 is listed in the table. Clarify how the PAUFs were calculated, and modify Table I-5.4-4 to display the correct PAUFs. Modify any subsequent calculations if necessary.

8. **Section 6.4.2.4., Site Contamination, Soil and Rock Sampling, pages 37 through 43:**

   NMED Comment: In the discussion for lead, the text states, "The preexcavated concentration of lead was 26,500 mg/kg from 0–1 foot (ft) below ground surface (bgs) at location 05-61380 (RE05-11-3393, excavated sample, Appendix F). Lead was detected at concentrations of 26.4 mg/kg and 60.1 mg/kg from 2–3 ft and 5–6 ft bgs, respectively.

   Overall, lead concentrations decreased with depth at this location and decreased laterally in all four directions at the excavation." The analytical results show that there are increasing concentrations of lead with increasing depth at location 05-613800. In addition, there are increasing concentrations of lead with increasing depth at location 05-614431. Modify the discussion of lead to state that there are increasing concentrations with increasing depth at locations 05-613800 and 05-614431. Provide a basis for the conclusion that the vertical extent of lead contamination is defined.

The Permittees must address all comments and submit a revised IR by **June 23, 2012**. As part of the response letter that accompanies the revised IR, the Permittees must include a table that details where all revisions have been made to the IR and that cross-references NMED's numbered comments. All submittals (including maps) must be in the form of two paper copies and one electronic copy in accordance with Section XI.A of the Order. The Permittees must also submit a redline-strikeout version that includes all changes and edits to the IR (electronic copy) with the response to this Disapproval.

If you have any questions regarding this letter, please contact Daniel Comeau at (505) 476-6043.

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: N. Dhawan, NMED HWB
D. Cobrain, NMED HWB
D. Comeau, NMED HWB
M. Dale, NMED HWB
S. Yanicak, NMED DOE OB, MS J993
T. Skibitski, NMED DOE OB
K. Rich, EP-CAP, MS M992
C. Rodriguez, DOE-LASO, MS A316
L. King, EPA 6PD-N

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